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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,749	08/17/2001	Yongfei Zhu	283014-00030	4614

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EXAMINER	
HAM, SEUNGSOOK	
ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 05/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,749	ZHU ET AL.	
	Examiner	Art Unit	
	Seungsook Ham	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,11 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9, 11, 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed on 1/11/02 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication (Kazuyoshi reference) or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Applicant is advised that should claim 11 be found allowable, claim 12 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-9, 11 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 1, "said dielectric capacitor including composite materials in their paraelectric state" is not described in the specification. Claims 3, 4, 11 and 12 also have the same limitation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Das (US '123, insofar as understood).

Das (fig. 4) discloses a voltage-controlled tunable filter including: first and second cavity resonators 141, 11; means for exchanging a signal between the first and second cavity resonators 36; first and second voltage tunable dielectric capacitors (i.e., ferroelectrics) 6, 16 positioned within the first and second cavity resonators, respectively; means for applying a control voltage to the first and second cavity resonators V, V2, respectively; an input and output probes 2, 3 coupled to the first cavity resonator. Moreover, Das teaches that the ferroelectrics is operated in the paraelectric phase (col. 1, lines 22-24)

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jackson (US '908, insofar as understood).

Jackson (figs. 1a-1c) discloses a voltage-controlled tunable filter including: first and second resonators R1, R2; means for exchanging a signal between the first and second cavity resonators C2; first and second voltage tunable dielectric capacitors C1 positioned within the first and second cavity resonators, respectively; means for applying a control voltage to the first and second cavity resonators V+, V-, respectively; an input and output coupled to the first cavity resonator; wherein each of the voltage tunable dielectric capacitor includes a tunable dielectric film disposed between first and second electrodes (see fig. 5a). Moreover, Jackson teaches that the capacitors are formed from a ferroelectric material (col. 3, lines 64-67) which inherently possesses paraelectric state.

Although Jackson does not clearly state that the resonators are cavity resonators, it is inherent from the device of Jackson that the resonators are coaxial cavity resonators since Jackson teaches the resonators R1, R2 may implemented in coax (col. 3, lines 56-62). Alternately, it would have been obvious to one of ordinary skill in the art to use coaxial cavity resonators as the resonators in the device of Jackson since Jackson also suggested that various types of resonators could be used (including coaxial resonators, col. 3, lines 56-62).

Regarding to claim 3, it is inherent that the tunable dielectric film/ferroelectric material in the device of Jackson comprised of barium strontium titanate since such material is well known ferroelectric material.

Claim Rejections - 35 USC § 103

Claims 2, 3, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Das (US '123) in view of Mueller et al. (US '263).

Das is applied as above. Das does not show the specific structure of the first and second voltage tunable dielectric capacitor.

Mueller et al. discloses a voltage tunable dielectric capacitor having a tunable dielectric film disposed between two electrodes (figs. 4 and 5); or the two electrodes are positioned on the same surface of the tunable dielectric film (figs. 15, 16).

It would have been obvious to one of ordinary skill in the art to use the voltage tunable dielectric capacitor of Mueller et al. in the device of Das since both variable capacitors are functionally equivalent.

Moreover, providing an insulating material to insulate the electrodes from the resonators is considered as an obvious modification to prevent short-circuit between the variable capacitor and the cavity resonators (see also Mueller et al., fig. 18, dielectric material 554).

Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (US '908) in view of McGann (US '504).

Jackson does not show the first and second voltage tunable dielectric capacitors positioned at the end of the first and second rods in the first and second coaxial resonators, respectively. However, such coaxial resonator structure is well known in the art as shown by McGann (fig. 3). Therefore, it would have been obvious to provide the first and second voltage tunable dielectric capacitors positioned at the end of the first and second rods in the first and second coaxial resonators, respectively in the device of Jackson since such design technique is well known as shown by McGann and also Jackson show the first and second tunable voltage tunable dielectric capacitors located at the end of the respective resonators (see fig. 1b).

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (US '908) in view of Mueller et al. (US '263).

The modified device of Jackson does not show the specific structure of the first and second voltage tunable dielectric capacitor.

Mueller et al. discloses a voltage tunable dielectric capacitor having a tunable dielectric film disposed between two electrodes (figs. 4 and 5); or the two electrodes are positioned on the same surface of the tunable dielectric film (figs. 15, 16).

It would have been obvious to one of ordinary skill in the art to use the voltage tunable dielectric capacitor of Mueller et al. in the modified device of Jackson since both variable capacitors are functionally equivalent.

Moreover, providing an insulating material to insulate the electrodes from the resonators is considered as an obvious modification to prevent short-circuit between the

variable capacitor and the cavity resonators (see also Mueller et al., fig. 18, dielectric material 554).

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed (US '029) or West (US '932) in view of Mueller et al. (US '263).

Reed (figs. 1 and 2) discloses a voltage-controlled tunable filter including: first and second cavity resonators 7; means for exchanging a signal between the first and second cavity resonators (resonators 7 are electromagnetically coupled to each other); first and second voltage tunable capacitors 23, 17, 25 (see also fig. 2) positioned at one end of the first and second rods, respectively; means for applying a control voltage to the first and second cavity resonators 23, respectively; an input and output probes 10, 11 coupled to the first cavity resonator.

West (figs. 1-4) also discloses a voltage-controlled tunable filter including: first and second cavity resonators 104, 106; means for exchanging a signal between the first and, second cavity resonators (electromagnetic coupling); first and second voltage tunable capacitors 118, 120 positioned within the first and second cavity resonators, respectively; means for applying a control voltage to the first and second cavity resonators 422, respectively; an input and output probes 408, 414 coupled to the first cavity resonator.

Reed and West do not show the voltage tunable capacitors are made of dielectric/ferroelectric material.

Mueller et al. discloses a voltage tunable dielectric capacitor having a tunable dielectric film disposed between two electrodes (figs. 4 and 5); or the two electrodes are

positioned on the same surface of the tunable dielectric film (figs. 15, 16). Mueller et al. also teaches the problem of conventional varactors (col. 2, lines 10-21).

It would have been obvious to one of ordinary skill in the art to use the voltage tunable dielectric capacitor of Mueller et al. in the device of Reed or West as the first and second voltage tunable capacitors to obtain low insertion loss and high breakdown strength as taught by Mueller et al. (col. 2, lines 25-32).

Moreover, providing an insulating material to insulate the electrodes from the resonators is considered as an obvious modification to prevent short-circuit between the variable capacitor and the cavity resonators (see also Mueller et al., fig. 18, dielectric material 554).

Response to Arguments

Applicant's arguments with respect to claims 1-9, 11 and 12 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed on 4/8/03 have been fully considered but they are not persuasive.

In response to the applicant's argument that Das does not teach the ferroelectric material operates in the paraelectric state (see REMARKS, pages 12 and 13), the examiner respectfully disagrees.

It should be noted that the original specification does not describe the ferroelectric material being operated in paraelectric state (see 35 USC 112, 1st paragraph rejection above). Thus, it is unclear as to how applicant is defining "paraelectric" state. Moreover, Das teaches that the ferroelectrics are operated in the

paraelectric phase (col. 1, lines 22-24). Since Das clearly teaches that using ferroelectric material as a voltage tunable dielectric capacitor, it is inherent that the ferroelectric material is also operated in the paraelectric phase.

In response to applicant's argument that Jackson does not mention tunable material and in its paraelectric state (see REMARKS, p. 13), the examiner respectfully disagrees.

Jackson clearly shows voltage tunable dielectric capacitors C1 and also teaches that the capacitor can be formed of a parallel plate capacitor with ferroelectric material (figs. 5a, 5b, col. 3, lines 61-66). Since the applicant did not clearly define "paraelectric state" in the original specification, and ferroelectric material operates in the paraelectric state (see Das, col. 1, lines 22-24), such limitation is clearly met by Jackson.

In response to applicant's argument that there is no motivation to combine Das and Mueller et al. (see REMARKS, pp. 14, 15), the examiner respectfully disagrees.

It should be noted that both Das and Mueller et al. use ferroelectric material for voltage tuning dielectric capacitor. And, the examiner clearly pointed out that both capacitors are functionally equivalent. Thus, it is the examiner's position that one of ordinary skill in the art would use the voltage tuning dielectric capacitor of Mueller et al. in the device of Das as the voltage tuning dielectric capacitor. Regarding the term, "paraelectric state", it is the examiner's position that both ferroelectric materials in Das and Mueller et al. (see col. 3, line 41-45) operate in the paraelectric state since applicant failed to define or explain the term in the specification.

Applicant failed to response to 35 USC 103 rejection of Claims 1-9 based on Reed (US '029) or West (US '932) in view of Mueller et al. (US '263). Thus, this rejection is still stand.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seungsook Ham whose telephone number is (703) 308-4090. The examiner can normally be reached on Monday - Thursday from 8:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Pascal can be reached on (703)308-4909. The fax phone

numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Seungsook Ham
Primary Examiner
Art Unit 2817

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May 8, 2003